

Monthly Marine Biotoxin Report December 2010

Technical Report No. 10-20

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of December, 2010. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

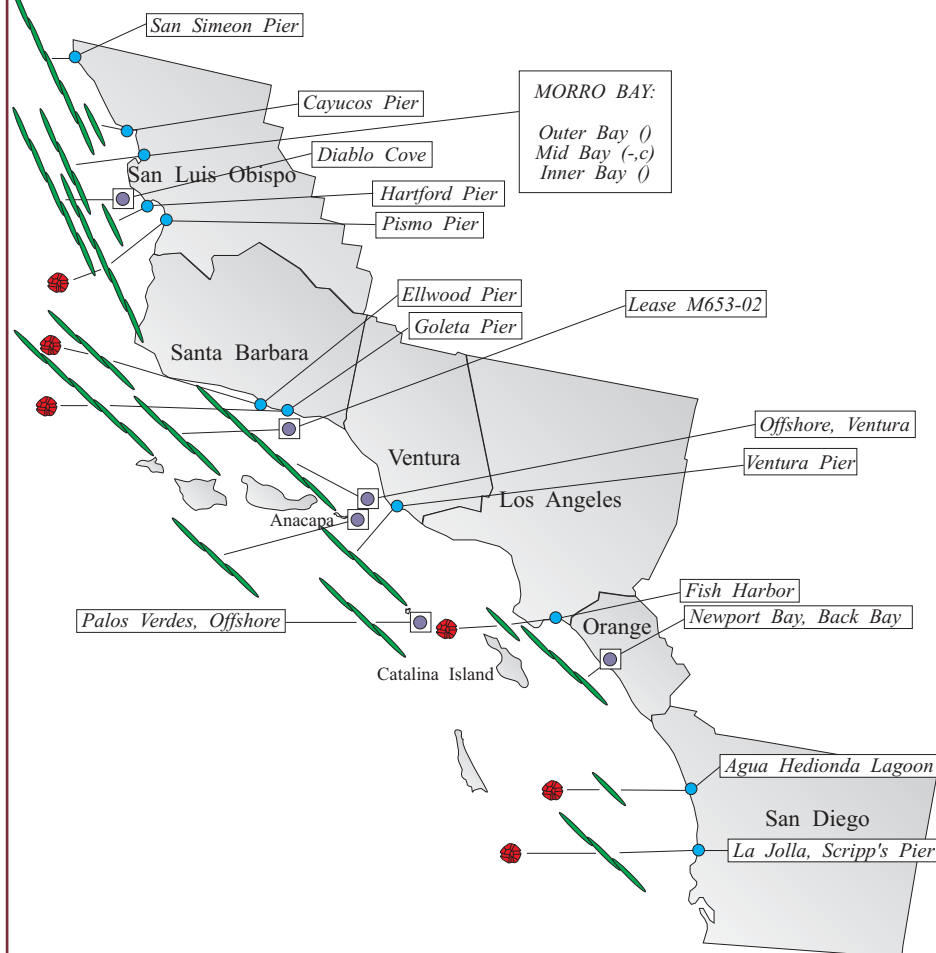
Southern California Summary:

Paralytic Shellfish Poisoning

Low numbers of *Alexandrium* were detected at sites in San Luis Obispo, Santa Barbara, Los Angeles, and San Diego counties (Figure 1). There was a noticeable decline in the distribution of this dinoflagellate at most San

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during December, 2010.



Relative Abundance of Known Toxin Producers

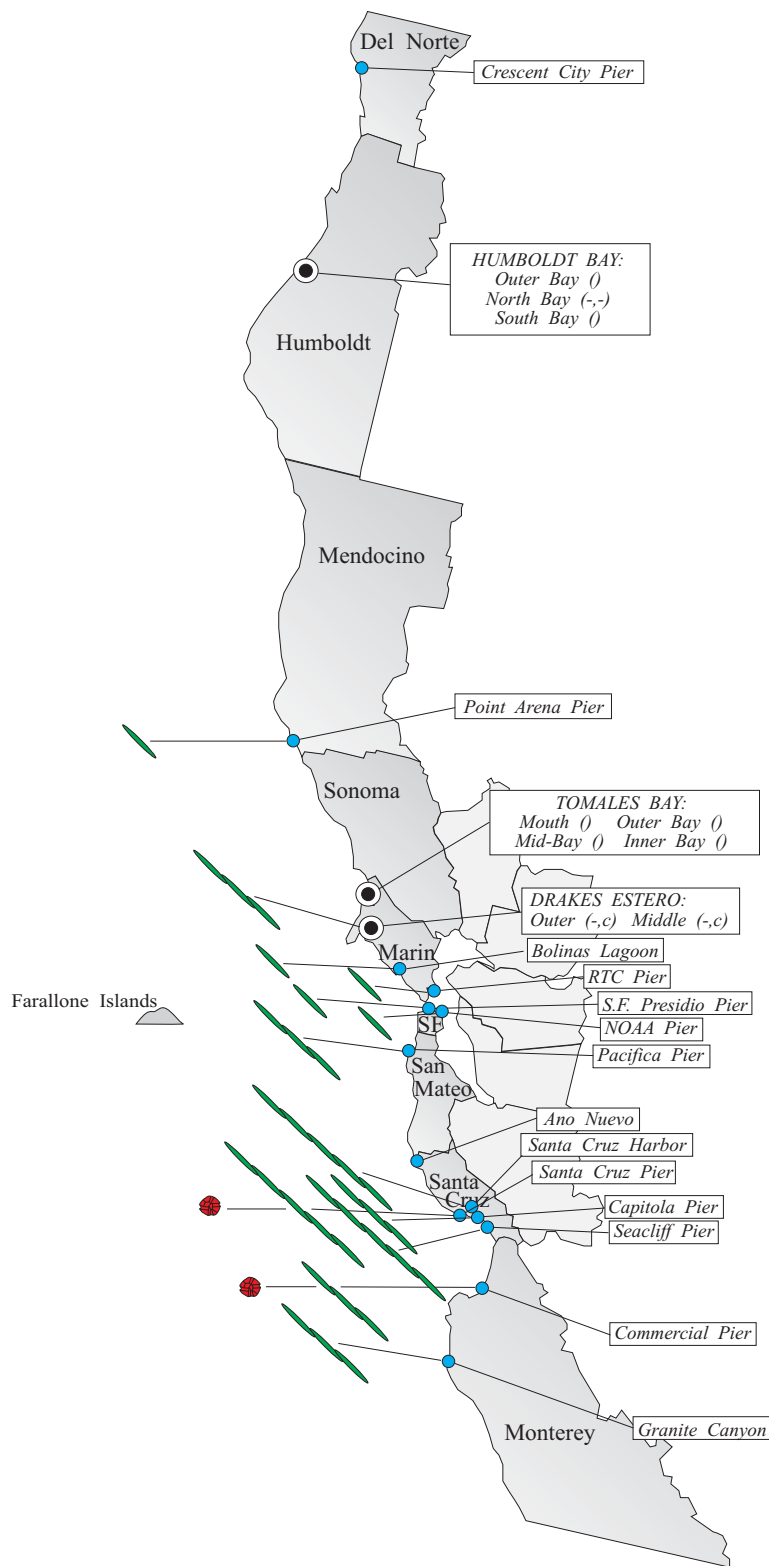
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during December, 2010.



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Luis Obispo sites compared to observations in November.

A low level of the PSP toxins was detected in one shellfish sample collected from Goleta Pier on December 29 (Figure 3).

Domoic Acid

Pseudo-nitzschia was common at a number of sites along the entire southern California coast during December (Figure 1). The relative abundance of *Pseudo-nitzschia* was lower than observed in November. The highest relative abundances of this diatom were observed at Pismo Pier (December 6) and Ellwood Pier (December 7).

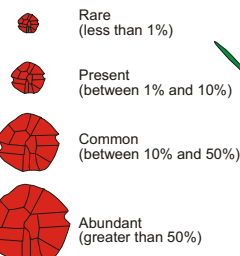
The high concentrations of domoic acid detected in samples of lobster viscera from the northern Channel Island chain in October and November persisted into December, although sampling was sparse this month. A sample of lobster viscera from the Santa Cruz Island region contained 148 ppm of domoic acid on December 6 (Figure 3). Additional lobster viscera samples from the vicinity of Catalina and San Clemente islands did not contain detectable levels of this toxin.

We would like to recognize the continued efforts of the California Department of Fish and Game and the CDPH Food and Drug Branch in obtaining samples to track toxin levels. We would also like to thank the staff of

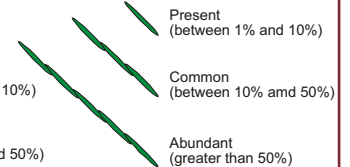
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



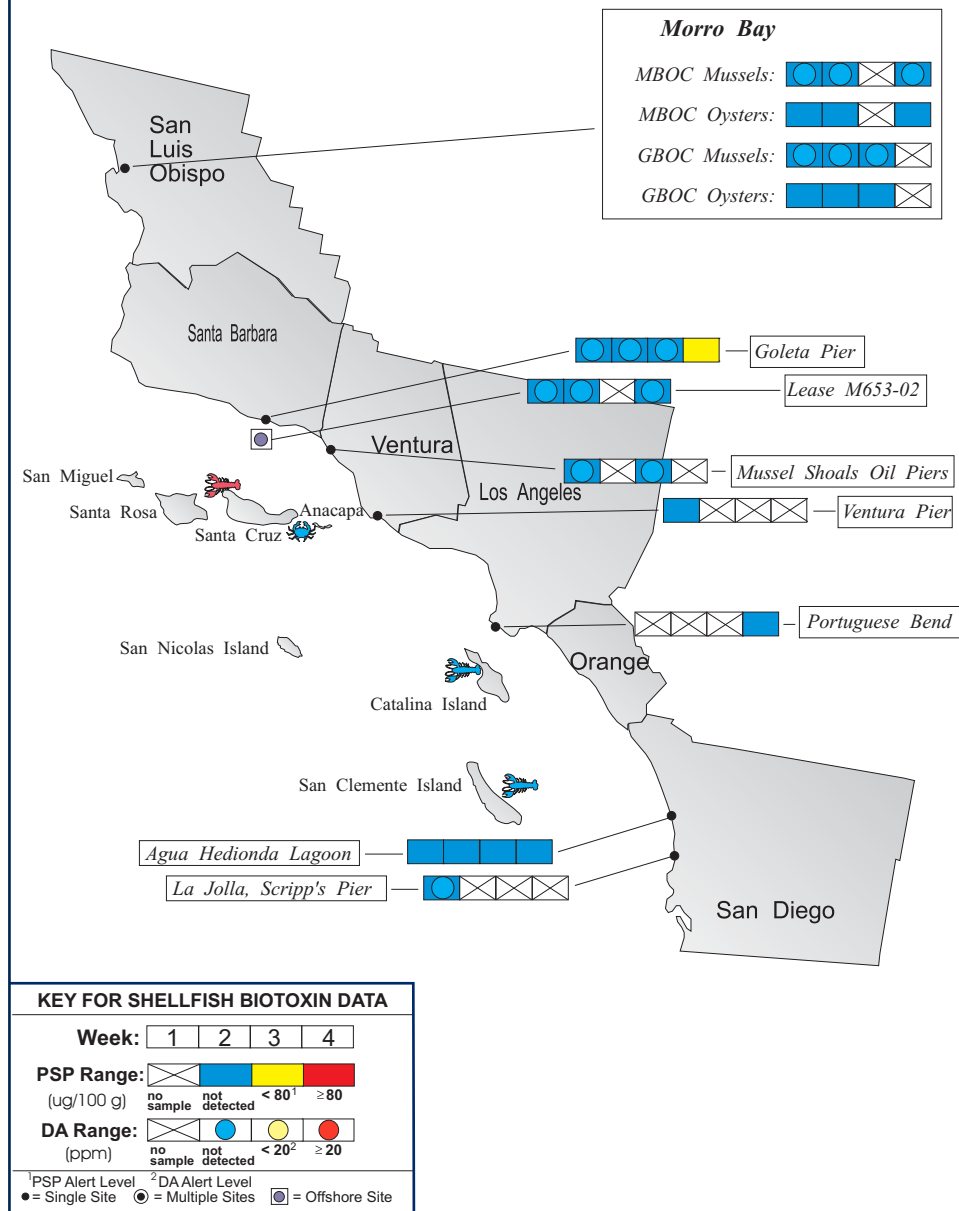
MONTHLY SAMPLING STATIONS:

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For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during December, 2010.



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the CDPH Food and Drug Laboratory Branch for their continued prompt analysis of samples for domoic acid, as well as the CDPH Environmental Microbial Diseases Laboratory for their assistance in receiving and processing these samples in addition to conducting all assays for the paralytic shellfish poisoning toxins.

Non-toxic Species

Because of the dominance of *Pseudo-nitzschia* there were no common diatoms or dinoflagellates observed at sites between San Luis Obispo and Ventura counties. Several dinoflagellate species were common between Los Angeles and San Diego counties (*Lingulodinium* and *Akashiwo*).

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at two northern California sampling sites in December (Figure 2). Low numbers of this dinoflagellate occurred at the Santa Cruz Pier and the commercial wharf in Monterey. Low levels of the PSP toxins were detected throughout the month in sentinel mussels from the Santa Cruz Pier (Figure 4).

Domoic Acid

Pseudo-nitzschia remained common to

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The Marine Biototoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553-4133

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abundant at sites between Marin and Monterey counties (Figure 2). The highest relative abundances of *Pseudo-nitzschia* were observed at Santa Cruz Pier (December 15) and to a lesser extent at the Monterey commercial wharf (December 6) and the Pacifica Pier (December 21).

Domoic acid was not detected in any shellfish samples analyzed during the month.

Non-toxic Species

Dinoflagellates were common in Del Norte (*Gonyaulax spinifera*) and Marin (*Ceratium furca*) counties, while diatoms (*Chaetoceros*) were common between San Francisco and Monterey counties.



QUARANTINES:

The October 16 health advisory remained in effect, warning consumers not to eat sport-harvested shellfish or the internal organs of crustaceans and small finfish from the Channel Islands. Elevated levels of domoic acid were first detected in the viscera of lobster in this region and subsequently in rock crab viscera.

The annual mussel quarantine ended at midnight on October 31, with the exception of the health advisory issued for the Channel Islands. When in effect, this quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively throughout the year. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin

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Figure 4. Distribution of shellfish biotoxins in Northern California during December, 2010.

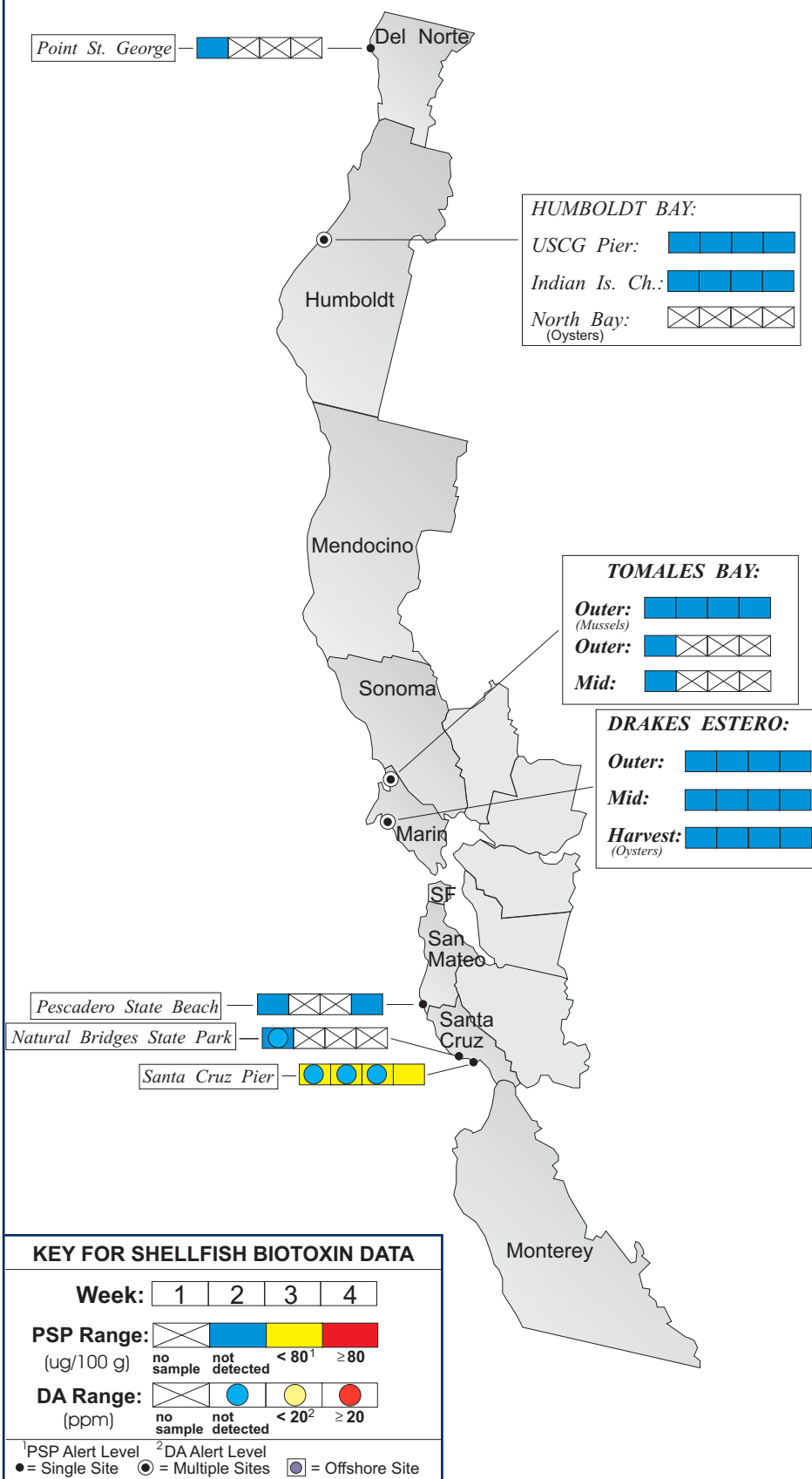


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during December, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	1
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	5
	Marin Oyster Company	1
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	6
	Morro Bay Oyster Company	5
Santa Barbara	Santa Barbara Mariculture Company	6
	U.C. Santa Barbara	5
	Department of Fish and Game; Food and Drug Branch	2
Ventura	CDPH Volunteer	1
Los Angeles	Los Angeles County Health Department	1
	Department of Fish and Game; Food and Drug Branch	2
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	1

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monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health. In addition, routine coastal phytoplankton and biotoxin monitoring is maintained throughout the quarantine period. Special quarantines or health advisories may be issued for additional seafood species as warranted by increasing toxin levels.

Consumers of Washington clams, also known as butter clams (*Saxidomus*

nuttalli), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to

concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

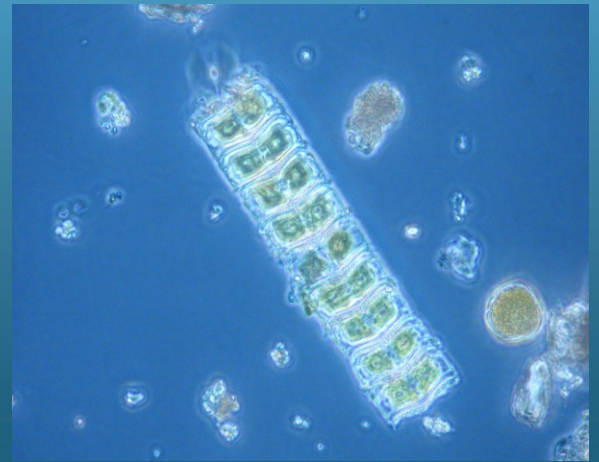
Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during December, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	4
Mendocino	CDPH Volunteer (<i>Marie De Santis</i>)	2
Sonoma	None Submitted	
Marin	CDPH Volunteer (<i>Brent Anderson</i>)	4
	Drakes Bay Oyster Company	11
	SFSU, Romberg Tiburon Center	3
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	4
	San Francisco Health Department	3
San Mateo	The Marine Mammal Center (<i>Stan Jensen</i>)	4
	San Mateo County Environmental Health Dept.	2
	U.C. Santa Cruz	1
Santa Cruz	San Lorenzo Valley High School	1
	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Dept.	3
Monterey	Monterey Abalone Company	4
	Marine Pollution Studies Laboratory	3
San Luis Obispo	Friends of the Sea Otter (<i>Kelly Cherry</i>)	5
	Monterey Bay National Marine Sanctuary	4
	Morro Bay Oyster Company	1
	Tenera Environmental	3
	The Marine Mammal Center (<i>Tim Lytsell, P.J. Webb</i>)	3
Santa Barbara	CDPH Volunteer (<i>Sylvia Short</i>)	2
	Santa Barbara Mariculture Company	2
	U.C. Santa Barbara	6
Ventura	CDPH Volunteer (<i>Fred Burgess</i>)	2
	Channel Islands National Marine Sanctuary	1
	National Park Service	1
Los Angeles	Los Angeles County Sanitation District	1
	Southern California Marine Institute	1
Orange	California Department of Fish and Game	6
San Diego	Carlsbad Aquafarms, Inc.	3
	Scripps Institute of Oceanography	4

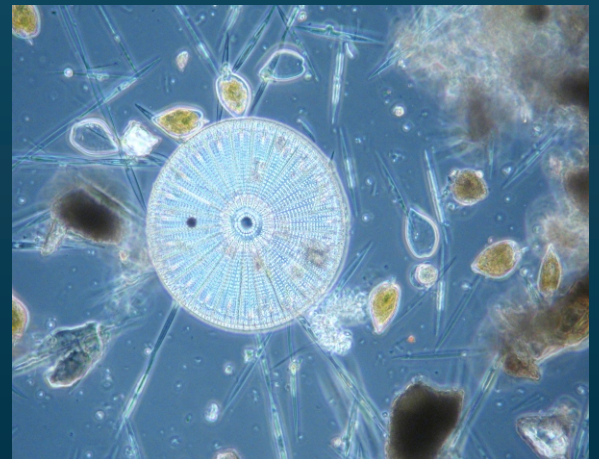
PHYTOPLANKTON GALLERY



The chain-forming diatom *Achnanthes* is occasionally observed in our samples.



The large diatom *Rhizosolenia* is seen here with a number of short *Pseudo-nitzschia* chains.



A centric diatom, *Coscinodiscus*, with a mix of *Pseudo-nitzschia* and the dinoflagellate *Prorocentrum*.